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Attorney Docket No.: 0180163

DAC/AB

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Ogle, et al.

Serial No.: 10/010,280

Filed: December 5, 2001

For: **Pretreatment of ONO Layer For Flash
Memory**

Art Unit: 2814

Examiner: Pizarro Crespo, Marcos D.

PETITION TO REVIVE UNDER 37 CFR §1.137

Mail Stop Petition
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir/Madam:

This is a petition to revive under 37 CFR §1.137. Alternatively, this is a request for withdrawing any holding of abandonment of the present application since, as illustrated below, the present application was abandoned due to the application file being lost or misplaced in the PTO and through no awareness or fault of the Applicant.

04/21/2004 AMONDAF2 00000069 10010280

01 FC:1452

110.00 OP

I. Applicant Respectfully Requests Revival Under 37 CFR §1.137(a)

37 CFR §1.137(a)(1):

A timely reply to the Final Office Action dated November 29, 2002 was filed on February 11, 2003 and was received and the postcard stamped by the USPTO on February 19, 2003 (see Exhibit A). The timely filed reply to the Final Office Action was subsequently lost or misplaced by the PTO and, in response to a telephonic request by the Examiner, was re-submitted to the PTO by the Applicant on February 23, 2004. Further, Applicant received an Advisory Action dated March 17, 2004 and filed a reply to the Advisory Action on March 24, 2004.

37 CFR §1.137(a)(2):

Applicant submits herewith a "Payment by Credit Card" form (PTO-2038) in the amount of \$110.00 as the required fee under 37 CFR §1.17(l). The Commissioner is hereby authorized to charge payment of any additional fees associated with this communication, or credit any overpayment, to Deposit Account No. 50-0731.

37 CFR §1.137(a)(3):

The entire delay in filing the required reply from the due date for the reply until the filing of this petition was unavoidable for the following reasons:

Applicant filed a timely reply to the Final Office Action dated November 29, 2002 on February 11, 2003 and received and postcard stamped by the USPTO on February 19, 2003 (see Exhibit A). Thus, the PTO received Applicant's reply to the Final Office Action well before the six-month deadline of May 29, 2003. As a result of having

received verification of Applicant's timely reply to the Final Office Action by receipt of the postcard stamped by the PTO, Applicant was reasonably expecting a PTO reply in the form of a Notice of Allowance or a timely Advisory Action. Furthermore, Applicant had no indication and, consequently, was unaware that a Notice of Allowance or a timely Advisory Action would not be forthcoming from the PTO.

However, through no fault of the Applicant, Applicant's timely response to the Final Office Action was lost or misplaced by the PTO. As a result, the present application was unavoidably abandoned when the non-extendable six-month time period to reply to the Final Office Action expired on May 29, 2003. Furthermore, Applicant's file was lost or misplaced by the PTO on November 2, 2003, found on December 12, 2003, lost a second time on February 5, 2004, and found again on February 24, 2004 (see PAIR report, Exhibit B).

Applicant immediately re-submitted, on February 23, 2004, the previously (and timely) filed reply to the Final Office Action in response to a telephonic request by the Examiner. Moreover, Applicant has never received a Notice of Abandonment from the PTO in the above-reference application. The first action Applicant has received from the PTO in response to Applicant's reply to the Final Office Action, timely filed on February 11, 2003, was an Advisory Action dated March 17, 2004. Applicant diligently filed a reply to that Advisory Action on March 24, 2004.

For the reasons stated above, Applicant respectfully requests that this petition be granted under 37 CFR §1.137(a) and the present application be revived, and that the

replies made to the Final Office Action and the Advisory Action be entered in the present application.

II. Alternatively, Applicant Respectfully Requests Withdrawal of any Holding of Abandonment and a Refund of this Petition Fee

In the alternative, and for the reasons stated above, it is requested that the PTO withdraw any holding of abandonment and refund the payment of \$110.00 made herein by crediting same to Applicant's deposit account No. 50-0731. Applicant further requests that the replies made to the Final Office Action and the Advisory Action be entered in the present application.

III. In the Unlikely Event that Applicants' Alternative Requests Made Above Are Denied, Applicant Respectfully Requests Revival Under 37 CFR §1.137(b)

In the unlikely event that the enclosed petition is not granted under 37 CFR §1.137(a) and the PTO does not withdraw any holding of abandonment; Applicant, for the reasons that follow, respectfully submits that the above-referenced application was unintentionally abandoned, and that all requirements of 37 CFR §1.137(b) have been met, and that this petition should be granted.

37 CFR §1.137(b)(1):

See above response to 37 CFR §1.137(a)(1).

37 CFR §1.137(b)(2):

The Commissioner is hereby authorized to charge payment of the amount of \$1,330.00 required under 37 CFR §1.17(m) as the fee for the present petition and to

charge any additional fees associated with this communication, or credit any overpayment, to Deposit Account No. 50-0731.

37 CFR §1.137(b)(3):

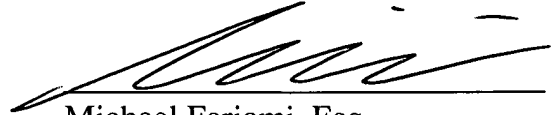
The entire delay in filing the required reply from the due date for the reply until the filing of this petition was unintentional.

IV. Conclusion

For the reasons stated above, Applicant respectfully requests that the enclosed petition be granted under 37 CFR §1.137(a) and the present application be revived, and that the replies made to the Final Office Action and the Advisory Action be entered in the present application. In the alternative, and for the reasons stated above, it is requested that the PTO withdraw any holding of abandonment and the payment of \$110.00 made herein be credited to Applicant's deposit account. In the unlikely event that the enclosed petition is not granted under 37 CFR §1.137(a) and the PTO does not withdraw any holding of abandonment, Applicant respectfully requests that the enclosed petition be granted under 37 CFR §1.137(b) and the present application be revived, and that the replies made to the Final Office Action and the Advisory Action be entered in the present application.

Respectfully Submitted,
FARJAMI & FARJAMI LLP

Date: 4/15/04



Michael Farjami, Esq.
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FARJAMI & FARJAMI LLP
Attorneys for Applicant

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Date of Deposit: 4/15/04

Lori Lapidario
Name of Person Mailing Paper and/or Fee

Lori Lapidario 4/15/04
Signature Date



TO: Michael Farjami, Esq.
FARJAMI & FARJAMI LLP
16148 Sand Canyon Avenue
Irvine, California 92618

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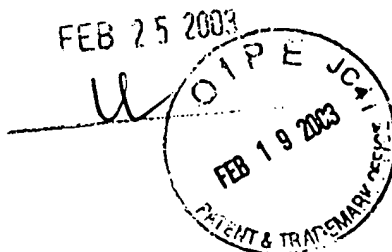
Receipt is acknowledged of:

Amendment and Response
for "Novel Oxidizing Pretreatment of Flash ONO Nitride
for Oxide Deposition";
Amendment Cover Sheet (2 pages); Amendment and
Response to Final Office Action (9 pages)

Client: Advanced Micro Devices, Inc.
Inventor: Ogle, et al.
Serial No.: 10/010,280
Filing Date: 12/5/2001
Atty: MF
Mailed First Class: February 11, 2003
Attorney Docket No.: 0180163
Client Docket No.: D916

DOCKETED

FEB 25 2003



AMENDMENT COVER SHEETIN RE APPLICATION OF: Ogle, et al.SERIAL NO.: 10/010,280 FILED: December 5, 2001FOR: Pretreatment Of ONO Layer For Flash MemoryHONORABLE COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

Sir:

Transmitted herewith is a paper in the above-identified application. Any necessary extension of time period set for this paper is hereby requested.

☒ No additional fee is required.☐ The fee has been calculated as shown below:☐ EXTENSION FEE

	RATE Non-Small Entity	RATE Small-Entity	FEE
FIRST MONTH AFTER TIME PERIOD SET	110.00	55.00	\$
SECOND MONTH AFTER TIME PERIOD SET	410.00	205.00	\$
THIRD MONTH AFTER TIME PERIOD SET	930.00	465.00	\$
FOURTH MONTH AFTER TIME PERIOD SET	1,450.00	725.00	\$

☐ TOTAL EXTENSION FEE \$ _____☐ FEE FOR EXTRA CLAIMS added by Amendment in this response:

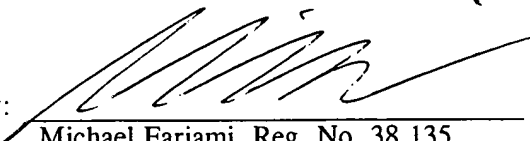
	Column 1	Column 2	Column 3			
	Number of Claims after Amendment	Number Previously Paid for	Number of Extra Claims	RATE Non-Small Entity	RATE Small Entity	FEE
TOTAL CLAIMS	22	MINUS **22	* = 0	x 18	x 9	\$
INDEPENDENT	8	MINUS ***8	* = 0	x 84	x 42	\$
First presentation of multiple dependent claim				+ 280	+ 140	\$

TOTAL FEE FOR EXTRA CLAIMS \$ _____

- * If the entry in Column 1 is less than the entry of Column 2, write "0" in Column 3.
 ** If the number of Total Claims previously paid for is less than 20, write "20" in this space.
 *** If the number of Independent Claims previously paid for is less than 3, write "3" in this space.

- ☐ Total fee for Supplemental Information Disclosure Statement \$ _____
- ☐ Enclosed is the total fee of \$ _____.
- ☐ Please charge Deposit Account No. 50-0731 in the amount of \$ _____
- ☒ The Commissioner is hereby authorized to charge payment of any additional fees associated with this communication, or credit any overpayment to Deposit Account No. 50-0731. A duplicate copy of this sheet is enclosed.

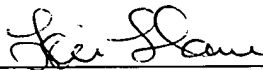
Date: 2/11/03

By: 
Michael Farjami, Reg. No. 38,135

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2/11/03



Signature

Lori Llave

Typed or Printed Name of Person Mailing Paper and/or Fee

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16148 Sand Canyon
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(949) 784-4600

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s): **Ogle, et al.**

Application Serial No.: **10/010,280**

Filed: **December 5, 2001**

Title: **Pretreatment Of ONO Layer For
Flash Memory**

Group Art Unit: 2814

Examiner: Pizarro Crespo, M.

AMENDMENT AND RESPONSE TO FINAL REJECTION

Assistant Commissioner for Patents
Washington, D.C. 20231

Dear Sir/Madam:

This is in response to the *final rejection*, dated November 29, 2002, in the above-referenced patent application. Reconsideration and allowance of pending claims 1-16 and 22-27 in view of the following amendments and remarks are respectfully requested.

In the Specification:

Please delete the present title and replace with the following new title:

--Pretreatment Of ONO Layer For Flash Memory--

In the Claims:

Please enter the following amended claims 1 and 10:

1. (Twice Amended) A method of forming a dielectric structure for a flash memory cell, the method comprising:

forming a first layer of silicon dioxide overlying a gate electrode of the flash memory cell;

forming a silicon nitride layer on the first layer of silicon dioxide;

pretreating the silicon nitride layer, said pretreating including oxidizing the silicon nitride layer, wherein a thickness of the silicon nitride is altered by no more than 10 to 20 Angstroms; and

forming a second layer of silicon dioxide on the pretreated silicon nitride layer by deposition.

10. (Twice Amended) A method of making a flash memory cell including a first polysilicon layer, the method comprising:

forming a first layer of silicon dioxide on the first polysilicon layer;

forming a silicon nitride layer on the first layer of silicon dioxide;

pretreating the silicon nitride layer, said pretreating including oxidizing the silicon nitride layer, wherein a thickness of the silicon nitride is altered by no more than 10 to 20 Angstroms;
and
forming a second layer of silicon dioxide on the pretreated silicon nitride layer by deposition.

REMARKS

The present amendment is in response to the Office Action, dated November 29, 2002, where the Examiner has *finally rejected* claims 1, 10, 15 and 16 pending in the application. Claim 22-27 have been allowed, and claims 2-9 and 11-14 have been objected to. By the present amendment, claims 1 and 10 have been amended. Accordingly, claims 1-16 and 22-27 are pending in the application. Reconsideration and allowance of pending claims 1-16 and 22-27 in view of the amendments and the following remarks are respectfully requested.

A. New Title

As requested by the Examiner, applicant has amended the title to correct a typographical error. Accordingly, the new title now recites "Pretreatment of ONO Layer For Flash Memory." Applicant respectfully submits that typographical error in the title has now been corrected.

B. Rejection of Claims 1, 10, 15 and 16 Under 35 USC § 103(a)

The Examiner has rejected claims 1, 10, 15 and 16 under 35 USC § 103(a) as being unpatentable over Hong et al. (USPN 5,445,984) ("Hong '984") in view of Eitan (USPN 5,966,603) ("Eitan '603"). Applicant respectfully disagrees; however, in order to expedite the prosecution of this application, applicant has amended independent claims 1 and 10 to specify "pretreating the silicon nitride layer, said pretreating including oxidizing the silicon nitride layer, wherein a thickness of the silicon nitride is altered by no more than 10 to 20 Angstroms" and "forming a second layer of silicon dioxide on the pretreated silicon nitride layer by deposition." For the reasons that follow, applicant submits that amended independent claims 1 and 10 are patentably distinguishable over the cited art of record, considered either solely or in combination.

Independent claims 1 and 10 are directed to a method for forming a dielectric structure and a polysilicon structure, respectively, each of which comprises a first silicon dioxide layer, a

silicon nitride layer and a second silicon dioxide layer, i.e., an “ONO” structure. As recited by amended claims 1 and 10, the method includes “pretreating the silicon nitride layer, said pretreating including oxidizing the silicon nitride layer, wherein a thickness of the silicon nitride is altered by no more than 10 to 20 Angstroms.” The method further includes forming a second layer of silicon dioxide on the pretreated silicon nitride layer by deposition.

It is noted at the outset, that the cited references, Hong ‘984 and Eitan ‘603, neither disclose nor suggest “pretreating” the silicon nitride layer. Specifically, the Examiner acknowledges that Hong ‘984 fails to teach deposition of the second silicon oxide layer after oxidizing the silicon nitride layer (Page 4 of the Detailed Action). Likewise, the Eitan ‘603 reference is devoid of any teaching or suggestion to pretreat the silicon nitride layer. However, the Examiner cites Eitan ‘603 as disclosing teaching the formation of the top oxide layer 34 by a combination of oxidation and deposition (Page 5 and 6 of the Detailed Action).

The Eitan ‘603 approach for forming the top oxide layer 34, however, is a significant departure from pretreating silicon nitride layer and subsequently forming the second silicon oxide layer as specified in claims 1 and 10. In Eitan ‘603, oxidation of the nitride layer involves a substantial consumption of the nitride layer itself. For example, Eitan ‘603 discloses that half of the oxide thickness of the top oxide layer “comes from the consumed nitride” (Col 3:54-57). In contrast, pretreatment as recited in claims 1 and 10 involved merely altering the nitride layer “by no more than 10 to 20 Angstroms.” Moreover, in Eitan ‘603, formation of the top oxide layer 34 involves the oxidation of the nitride layer in Eitan ‘603 to form part of the top oxide layer 34. It is for this reason that a substantial portion of the nitride layer is consumed in Eitan ‘603. In contrast, the pretreating step as recited in claims 1 and 10 merely alter the nitride layer, so that, for example, the mobile ionic contaminants in the nitride layer is reduced. In other words, the oxidation process in Eitan ‘603 is part of the formation of the top oxide, whereas in claims 1 and

10 pretreating merely alters the characteristics of the nitride layer. In contrast, amended claims 1 and 10 specify that formation of the second silicon oxide layer is carried out by deposition, not by oxidation nor by a combination of oxidation and deposition. In sum, if oxidation of the nitride layer is carried out as disclosed by Eitan '603, such a process would not involve pretreatment of the nitride layer as specified in claims 1 and 10, but rather the consumption of the nitride layer to form a significant portion of the top oxide layer. Therefore, the combined teaching of Hong '984 and Eitan '603 fail to disclose, teach or suggest the claimed invention as recited in claims 1 and 10. Accordingly, it is respectfully submitted that rejection of independent claim 1 and its corresponding dependent claims 2-9, and independent claim 10 and its corresponding dependent claims 11-16 have been traversed, and that therefore claims 1-16 should now be allowed.

C. Objection to Claims 2, 6 and 11-14 Under 37 CFR § 1.75

The Examiner has objected to claims 2, 6 and 11-14 under 37 CFR § 1.75 as being substantial duplicates of claims 22-27, respectively. As discussed above independent claims 1 and 10 have been amended. Applicant respectfully submits that dependent claims 2 and 6 depending from independent claim 1 and dependent claims 11-14 depending from independent claim 10, due to the amendments to claims 1 and 10, are not substantial duplicates of claims 22-27, respectively. For the reasons discussed above in conjunction with claims 1 and 10, applicant respectfully submits that claims 2, 6 and 11-14 should now be allowed.

D. Allowed Claims


Claims 22-27 stand allowed.

E. Conclusion

For all the foregoing reasons, allowance of claims 1-16 and 22-27 pending in the present application is respectfully requested.

Respectfully Submitted;
FARJAMI & FARJAMI LLP

Dated: 2/10/03

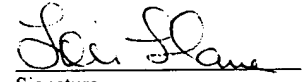

Michael Farjami, Esq.
Reg. No. 38,135

Michael Farjami, Esq.
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16148 Sand Canyon
Irvine, California 92618
Tel: (949) 784-4600
Fax: (949) 784-4601

CERTIFICATE OF MAILING

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Lori Llave
Name


Signature

VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the Specification:

The title has been amended as follows:

~~Oxidizing Pretreatment of NON~~ Of ONO Layer For Flash Memory

In the Claims:

Claims 1 and 10 have been amended as follows:

1. (Twice Amended) A method of forming a dielectric structure for a flash memory cell, the method comprising:

forming a first layer of silicon dioxide overlying a gate electrode of the flash memory cell;

forming a silicon nitride layer on the first layer of silicon dioxide;

~~oxidizing pretreating~~ the silicon nitride layer, said pretreating including oxidizing the silicon nitride layer, wherein a thickness of the silicon nitride is altered by no more than 10 to 20 Angstroms; and

forming ~~depositing~~ a second layer of silicon dioxide on the pretreated silicon nitride layer by deposition ~~after the oxidizing~~.

10. (Twice Amended) A method of making a flash memory cell including a first polysilicon layer, the method comprising:

forming a first layer of silicon dioxide on the first polysilicon layer;

forming a silicon nitride layer on the first layer of silicon dioxide;

~~oxidizing~~ pretreating the silicon nitride layer, said pretreating including oxidizing the
silicon nitride layer, wherein a thickness of the silicon nitride is altered by no more than 10 to 20
Angstroms; and

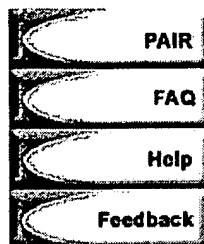
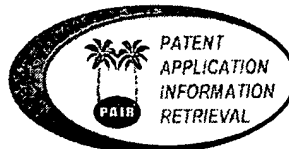
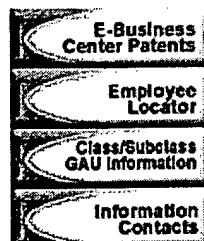
forming ~~depositing~~ a second layer of silicon dioxide on the pretreated silicon nitride layer
by deposition after the oxidizing.



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0180163

PATENT APPLICATION INFORMATION RETRIEVAL**Other Links**

Search results for application number:10/010,280			
Application Number:	10/010,280	Customer Number:	25700
Filing or 371(c) Date:	12-05-2001	Status:	Response after Final Action Forwarded to Examiner
Application Type:	Utility	Status Date:	02-24-2004
Examiner Name:	PIZARRO CRESPO, MARCOS D	Location:	TC-2800 LIE, CP-4, 6C23
Group Art Unit:	2814	Location Date:	02-24-2004
Confirmation Number:	5067	Earliest Publication No:	-
Attorney Docket Number:	M-7522 US	Earliest Publication Date:	-
Class/ Sub-Class:	257/315	Patent Number:	-
First Named Inventor:	Robert Ogle, San Jose, CA (US)	Issue Date of Patent:	-
Title Of Invention:	OXIDIZING PRETREATMENT OF NON LAYER FOR FLASH MEMORY		

Select Search Option

Continuity Data

Publication Review

Search

File History		
Number	Date	Contents Description
32	02-24-2004	IFW Amended case processing Complete
31	02-24-2004	Date Forwarded to Examiner
30	02-23-2004	Amendment after Final Rejection
29	02-24-2004	File Marked Found
28	02-05-2004	File Marked Lost
27	12-12-2003	File Marked Found
26	11-02-2003	File Marked Lost
25	02-24-2003	Correspondence Address Change
24	02-24-2003	Change in Power of Attorney (May Include Associate POA)
23	11-29-2002	Mail Final Rejection (PTOL - 326)
22	11-27-2002	Final Rejection
21	11-06-2002	Date Forwarded to Examiner
20	10-25-2002	Response after Non-Final Action
19	08-26-2002	Mail Non-Final Rejection
18	08-23-2002	Non-Final Rejection
17	07-02-2002	Date Forwarded to Examiner
16	06-19-2002	Response to Election / Restriction Filed
15	05-29-2002	Mail Restriction Requirement
14	05-29-2002	Requirement for Restriction / Election
13	05-02-2002	Case Docketed to Examiner in GAU
12	05-02-2002	Case Docketed to Examiner in GAU